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Crowding Perceptions and Satisfaction in National Parks: When will we learn?

Introduction

It's almost humorous (in a sad sort of way) and certainly predictable after all these years that concerns about crowding and what to do about crowding in natural areas is still a hot topic of discussion. Studies of crowding in a variety of venues (natural and man-made) continue to provide mixed results in terms of the visitor experience and date back to the 1970's as a research topic in each of the past five decades (Desor, 1972; Kim & Shelby, 2011; Manning, Valliere, Wang & Jacobi, 1999; Shelby, Vaske, Heberlein, 1989; Vaske, Donnelly, and Heberlein, 1980; Womble and Studebaker, 1981).

In 1989, Shelby, Vaske, and Heberlein looked back at 15 years of crowding research which used a standard one-question crowding question in surveys. They concluded: "Areas where perceived crowding is between 50 and 65% should be carefully scrutinized because they are probably approaching capacity. It has been our experience that it is almost impossible to reduce use levels when capacity has been exceeded; one can only hold the line on visitor numbers, and without good data it is difficult to hold the line. When areas show crowding levels in the high-normal category, study is necessary to anticipate problems and to plan for future management." (Shelby, Vaske, Heberlein, 1989).

Assessing the level of crowding and acting upon the perceived crowding levels, therefore, requires continual monitoring by land managers. As Vaske & Shelby wrote in 2008, "Given current population growth rates, crowding will likely continue to be an important research and management issue." Today's uncrowded area could (and do) become tomorrow's next crowded spot. The purpose of this study, therefore was to assess crowding in Yellowstone National Park as it has experienced double digit increases in visitation over the past decade.

Literature Review

Crowding studies started with Daniel Stokols and others in 1973 with psychological experiments assessing human behavior when placed in a small room with other people. The results were mixed. They determined that social and personal variables mediated their perception and experience of crowding. After those experiments, researchers in the outdoor recreation realm started studying crowding on public lands in earnest and became one of the most frequently studied aspects of outdoor recreation (Alazaizeh, Hallo, Backman, Norman & Vogel, 2016; Fleishman, Feitelson, & Salomon, 2004; Manning, Lime, Freimund, & Pitt 1996; Sim, K.W., Koo, C., Koo T.R., & Lee, H.S., 2018).

Today, crowding is studied in the tourism industry as "overtourism" but has been extended beyond the national parks and protected areas to a variety of settings including large cities, urban parks, or anywhere volumes of people gather while on vacation. Wall (2020), discussed how the issues of overtourism are truly not new but have now expanded beyond the natural areas where even more people live and are impacted by high visitation.

The responses by local residents to overtouirsm has been to protest tourism, denounce tourism promotion, and to create discomfort for those traveling in their area (Seraphin, Sheeran, & Pilaot, 2018). Venice, for example is dealing with negative impacts brought on by too many tourists such as vandalism and crime, parking problems, traffic congestion, pollution and the destruction of

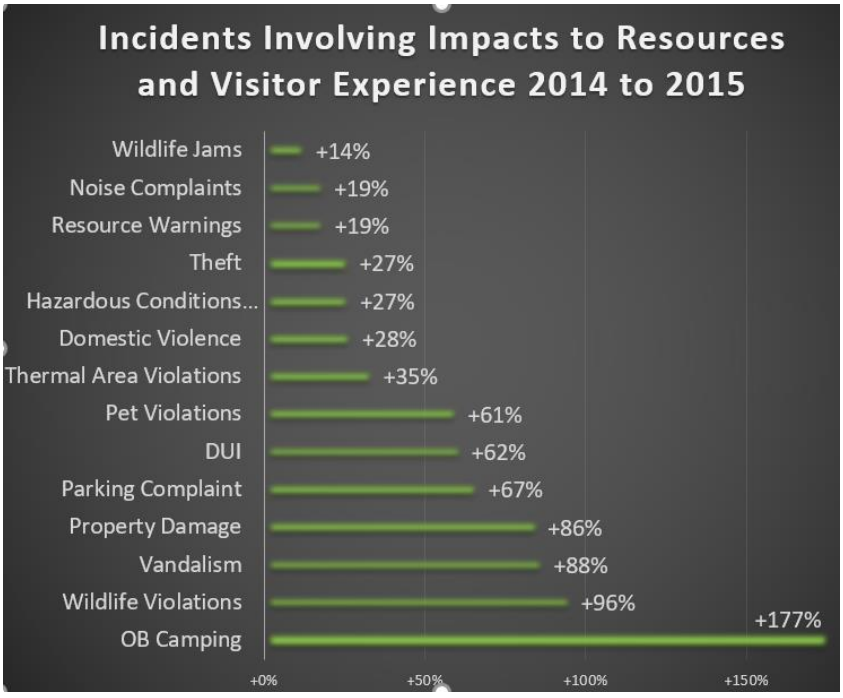
historical sites (Borg, et. al.,1996; Yazdi & Khanalizadeh, 2017). The local population of Venice has declined by two thirds in the last 50 years. Residents moved out but tourist numbers have exploded.

In the 2019 book, *Overtourism; Excesses, Discontents and Measures in Travel and Tourism,* overtourism is described as the excessive growth of visitors leading to overcrowding in areas where residents suffer the consequences of temporary and season tourism peaks which have caused permanent changes to their lifestyles, denied access to amenities and damaged their general well being (Milano, Cheer, & Novelli 2019). The many edited chapters provide example after example of how too many people in one area at one time cause issues with natural resources, dissatisfied local residents, and an emerging demand that this (tourism issue) has to stop.

While local residents are affected negatively with overtourism, crowding in natural areas can, and does, negatively affect the flora and fauna. Unlike disgruntled local residents, the animals and vegetation can't protest – they simply leave, die out, or in some rare instances adapt to these new impacts on their health. So, how are protected area managers dealing with crowding? This study looks at crowding in our world's first national park: Yellowstone.

In just four years between 2013-2016, Yellowstone National Park visitor numbers rose 31 percent to nearly 4.3 million recreation visits. While in the past two years Yellowstone has seen a slight decrease in visits, numbers still exceed 4.1 million per year. The rapid growth in visitation caught managers by surprise. Between 2014 and 2015 problems with visitors and their impacts increased between 14% for wildlife jams to 177% for out of bounds camping (Figure 1).

Figure 1: One-year increase in visitor violations in Yellowstone National Park



Source: Yellowstone National Park and Ryan Atwell, YNP social scientist

In 2016, Yellowstone commissioned a traffic study to help them understand where and when crowding was likely causing negative impacts to the park, the resources and the visitor experiences. The results of that study helped guide the subsequent study described here.

The purpose of this study was to assess crowding and satisfaction in Yellowstone National Park at the micro level including attractions within the park and congested roadways while visitors were currently experiencing these identified crowded areas. A second purpose was to identify visitor segments and differences between segments on perceptions of crowding and other characteristics.

Methodology

Two intercept methods were conducted during one week each month from May through September 2018 in Yellowstone.

1. **Geofence Survey:** Yellowstone visitors were flagged over in their car and asked if they would take a tablet in their vehicle for one day and answer surveys that would pop up on the tablet based on geofences that were constructed on an App for this study. The purpose was to capture an array of information about their perceptions of crowding, values, expectations, and trip characteristics 'in the moment' of their visit and travels through the park. Understanding how those experiences changed across different park locations and seasons was assessed. The geofence survey respondents who took the tablet in their vehicle had the GPS device turned on so it recorded their vehicle speed, stopping points and parking times. A 73% response rate was attained in the geofence methodology garnering 1,425 useable responses.
2. **Attraction Intercept Survey:** Additional respondents were intercepted at a range of attractions within the park and asked to complete an on-site survey. This method was used to gather enough data for segmentation of visitors. A 76% response rate was attained in the attraction survey methodology for 2,738 useable surveys.

The technique using geofences provided the ability for immediate behavioral responses to park managers. With data collected on the tablet, managers received dashboard results from the research team each week the data was collected. This allowed managers to adjust the location of personnel to assist in problem areas.

There were 1,425 respondents to the Geofence survey with a 73% response rate. The attraction intercept survey had a 76% response rate for a total response of 2,738. Data were weighted to represent the population of visitors through the assessment of four key questions asked of both non-respondents and respondents. Separate analyses were conducted on the two surveys to avoid confusion but both are reported here.

Results

Frequencies and percentages were run on all data. Chi Square, t-tests, and Anovas were run on data where groups were compared. Key findings are provided below:

- Respondents at each site in the Geofence survey rated the quality of their overall Yellowstone experience highly with the means ranging from 3.8 at Midway Geyser Basin to 4.4 at Old Faithful (1=very poor to 5=excellent).
- Between 38% to 48% of visitors at each attraction said the number of people they encountered was what they expected. However, at Midway Geyser Basin and Fairy Falls, 42% to 44% of people encountered a little or a lot more people than they expected.

- Sixty percent of respondents at Midway Geyser Basin indicated that traffic was a moderate to big problem. Traffic was less likely to be considered a problem at Old Faithful, North and South Canyon Rims, and Canyon Village.

- Parking was less likely to be a problem at Old Faithful, Canyon Village and the North and South Canyon Rims. At Midway Geyser Basin, 56% of respondents said parking was a moderate or big problem. Additionally, 48% at Fairy Falls and 33% at Norris Geyser Basin found parking to be a problem.

- When asked if there was a problem with too many people at the site they just visited, few people rated it as a big problem. The area with the highest number of respondents saying it was a moderate to big problem was Midway Geyser Basin (48%) and Fairy Falls (36%).
- In this study, if visitors were traveling at a lessor speed than the posted speed limit, they did not get frustrated to any great degree and their experience was not diminished. This is in contrast to typical behavior on roadways for commuting and moving goods. Usually, as the volume of traffic increases, the average speed decreases and the variability increases, leading to uncertainty in travel time. This often results in driver frustration and wasted time in traffic. In this light, one might expect that as speed declined in Yellowstone, frustration would increase and the perceived visitor experience would decline. However, this did not occur.
- Overall, each roadway segment yielded average frustration levels of less than 2.0 (1=not at all frustrated to 5=very frustrated) and average experience ratings in excess of 4.0 (1= very poor to 5=excellent).

- The type of respondent based on their frequency of visits to Yellowstone showed significant differences in their perception of problems. Compared to first-time visitors and visitors who have previously visited but have not been to the park in the past three years, recent repeat visitors (people who have visited within the past three years) are significantly more likely to say there are problems with:
    - Traffic congestion
    - Too many people
    - Availability of parking
    - Availability of restrooms
    - Feeling safe on boardwalks
    - People acting unsafe around thermal features
    - People acting unsafe around wildlife
    - People walking on, across, or along the road
- Recent repeat visitors also felt that experiencing a wild place was significantly more important to them than other visitors, while first-time visitors said seeing geysers and thermal features was significantly more important to them. Similarly, the longer a respondent had already been in the park during their visit, (5 days or more) the more likely they became comparable to frequent visitors perceiving greater problems with other people and preferring to have more natural ‘quiet’ experiences.

Conclusion and Discussion

Results from this multi-faceted study show a high degree of overall satisfaction throughout the park. While visitors expressed some frustration points in the survey, nearly 95% of all respondents said their experience was good to excellent.

One of the more interesting findings was the differences between repeat visitors and first-time visitors in satisfaction and frustration levels with crowding and visitor behavior. It is likely that repeat visitors and those who were intercepted later in their visit to Yellowstone were no longer wearing 'rose colored glasses'. They were probably more in-tune to their surroundings and could differentiate and notice unacceptable visitor behavior like getting too close to wildlife or acting unsafe around thermal features. Managers will need to take note of these differences and determine how they can manage the park for both first timers and repeat visitors.

Analysis of the data provided key evidence of visitor experiences by site, by month, by travel variations in speed and parking wait times, and by respondent segments. Significant differences were found between July visitors and all other monthly visitors in a number of aspects including satisfaction and acceptance of behaviors by other visitors. Should July visitation be capped?

Further analysis showed the certain sites within the park (Midway Geyser Basin and Fairy Falls) were the two locations where respondents were more likely to experience a greater sense of crowding, traffic congestion, and parking availability. This allows managers to aggressively plan for ways to alleviate these problem areas.

As stated by Shelby, et.al., "It has been our experience that it is almost impossible to reduce use levels when capacity has been exceeded; one can only hold the line on visitor numbers, and without good data it is difficult to hold the line." This was written in 1989. In today's social media and well-connected world, it is perhaps much easier for visitors to know what to expect in terms of crowding in parks and adjust their expectations accordingly before they even arrive. Is this why visitors to Yellowstone were satisfied and not too harsh in their evaluation of crowding even when the volume of visitors is at an all-time high? If so, measuring satisfaction and perceived crowding levels as was done in this study, may not be a useful measurement anymore. And if this is true, what variables should be used to study the impacts of crowding? Perhaps visitor surveys need to give way to assessments of resource damage and safety conditions to determine visitation levels in protected areas like Yellowstone.

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